

CLAIMS

What is claimed is:

- 5 1. A method of operating a concatenated contact image-sensing module Scanner wherein the concatenated contact image-sensing module Scanner includes a plurality of contact image sensors module (CIS), comprising:

 providing a first contact image sensor module for executing a first document reading session through the trigger of a start pulse, and then the first contact
10 image sensor module outputting a corresponding first scanned image signal;

 providing a second contact image sensor module operatively connected to the first contact image sensor module for executing a second document reading session and then the second contact image sensor module outputting a corresponding second scanned image signal; and

15 providing a third contact image sensor module operatively connected to the second contact image sensor module for executing a third document reading session and then the third contact image sensor module outputting a corresponding third scanned image signal; wherein the first, the second and the third scanned image signals are selected to be outputted sequentially.

- 20 2. The method of claim 1, further comprising a step of providing a first end pulse and a second end pulse outputted from the first and the second contact image sensors module to the second and the third contact image sensor module , respectively, for triggering executions of the second and third document reading
25 sessions.

3. The method of claim 1, further comprising a step of providing an analog switch for receiving the first, the second and the third scanned image signals, wherein the analog switch further includes an internal counter therein wherein the internal counter sets an predetermined period of time in order to have the analog switch to select and output one of the first, the second and the third scanned image signals in a sequential manner.

4. The method of claim 1, further comprising a step of providing a software for integrating the corresponding outputted image signals in correspondingly sequential document reading sessions together.

5. The method of claim 1, further comprising a step of providing a timing generator for providing the start pulse to the first contact image sensor module.

6. The method of claim 1, wherein the first and the second contact image sensor module further output a first end pulse and a second end pulse to the second and the third contact image sensor module, respectively, as the first and the second document reading sessions are finished, for triggering executions of the second and the third document reading sessions.

7. The method of claim 1, further comprising a step of placing a first series of contact image sensor module and a second series of contact image sensor module disposed horizontally with respect to the first series of contact image sensor module, wherein the first and the second series of contact image sensor module are operated sequentially.

8. An optical scanner comprising:

a concatenated contact image-sensing module having a plurality of contact image sensor modules each operatively connected to another in series; and
a timing generator for providing a start pulse into a first contact image sensor module to trigger a first document reading session thereof and output a first scanned image signal;

wherein the concatenated CIS Scanner further comprises a second and a third contact image sensor modules for performing a second and a third document reading sessions, respectively, once triggered and outputting a second and a third scanned image signals, wherein the first, the second and the third contact image sensors are triggered sequentially.

9. The optical scanner of claim 8, wherein the CIS Scanner further includes a first series of contact image sensor module and a second series of contact image sensor module disposed horizontally with respect to the first series of contact image sensor module, wherein the contact image sensor module of the first and the second series of contact image sensor module are operated sequentially.

10. The optical scanner of claim 8, wherein the first and the second series of contact image sensor module are operated sequentially.

11. The optical scanner of claim 8, further comprising at least one analog-to-digital converter for receiving the first, the second and the third scanned image signals outputted from the first, the second and third document reading sessions, respectively, and converting the first, the second and the third scanned image signals into corresponding digitalized forms.

12. The optical scanner of claim 11, further comprising a digitalized image processor operatively connected to the analog-to-digital converter for receiving the first, the second and the third scanned image signals in digitalized forms.

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13. The optical scanner of claim 8, further comprising an analog switch operatively connected to the first, the second and the third and more contact image sensor modules, for receiving the first, the second and the third and more scanned image signals, and selecting and then outputting one of the first, the second and the third and more scanned image signals sequentially.

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14. The optical scanner of claim 13, wherein the analog switch further includes an internal counter for setting a predetermined period of time, in order to select and then output one of the first, the second and the third and more scanned image signals sequentially with the predetermined period of time duration.

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15. The optical scanner of claim 8, wherein the first and the second contact image sensor modules output a first and a second end pulses to the second and third contact image sensor modules, respectively, in order to trigger the second and the third and more contact image sensor modules sequentially.

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16. The optical scanner of claim 8, further comprising at least one interface for interfacing the optical scanner with at least one computer.

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17. The optical scanner of claim 8, wherein the interface is an USB-based interface.

18. The optical scanner of claim 8 further comprising: a
a light source of the concatenated contact image-sensing module.

19. The optical scanner of claim 18, wherein the light source is a colorful or
5 monochromatic visible light.

20. The optical scanner of claim 18, wherein the light source is an invisible light.

21. The optical scanner of claim 20, wherein the invisible light is an infrared (IR) or
10 ultraviolet (UV) light.

22. An optical scanner comprising:

a concatenated contact image-sensing module having a plurality of contact
image sensor modules each operatively connected to another in series; and
15 a timing generator for providing a start pulse into an end contact image
sensor module to trigger a corresponding document reading session thereof
and output a corresponding scanned image signal, wherein the end contact
image sensor module is located at one end of the series-connected contact
image sensor modules;

20 wherein the end contact image sensor module outputs a first end pulse as a
second start pulse to another contact image sensor module, which is adjacently
operatively connected to the end contact image sensor module, for outputting
another scanned image signal after the document reading session of the end
contact image sensor module is finished.

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23. The optical scanner of claim 22, wherein the contact image module scanner

further includes a first series of contact image sensor module and a second series of contact image sensor module disposed horizontally with respect to the first series of contact image sensor module, wherein the contact image sensor module of the first and the second series of contact image sensor module are operated sequentially.

24. The optical scanner of claim 22, wherein the first and the second series of contact image sensor modules are operated sequentially.

25. The optical scanner of claim 22, further comprising at least one analog-to-digital converter for receiving the scanned image signals outputted from the corresponding contact image sensors and converting the scanned image signals into corresponding digitalized forms.

26. The optical scanner of claim 25, further comprising a digitalized image processor operatively connected to the analog-to-digital converter for receiving the scanned image signals in digitalized forms.

27. The optical scanner of claim 22, further comprising an analog switch operatively connected to the contact image sensors, for receiving the scanned image signals and selecting and then outputting one of the scanned image signals sequentially.

28. The optical scanner of claim 27, wherein the analog switch further includes an internal counter for setting a predetermined period of time, in order to select and then output one of the scanned image signals sequentially with the predetermined period of time duration.

29. The optical scanner of claim 22, wherein the contact image sensor modules each
outputs a corresponding end pulse to the adjacently operatively connected image
sensor module, in order to trigger the second and the third contact image sensor
modules sequentially.
30. The optical scanner of claim 22, further comprising at least one interface for
interfacing the optical scanner with at least one computer.
31. The optical scanner of claim 22, wherein the interface is an USB-based interface.
32. The optical scanner of claim 22 further comprising: a
a light source of the concatenated contact image-sensing module.
33. The optical scanner of claim 32, wherein the light source is a colorful or
monochromatic visible light.
34. The optical scanner of claim 32, wherein the light source is an invisible light.
35. The optical scanner of claim 34, wherein the invisible light is an infrared (IR) or
ultraviolet (UV) light.
36. An optical scanner comprising:
a concatenated contact image-sensing module having a plurality of contact
image sensor modules each operatively connected to another in series; and
a timing generator for providing a start pulse into an end contact image

sensor module to trigger a corresponding document reading session thereof and output a corresponding scanned image signal, wherein the end contact image sensor module is located at one end of the series-connected contact image sensor modules;

- 5 wherein a portion of these CIS modules is placed in a face-up manner and another portion is placed in a face-down manner; thereby, the optical scanner being capable of scanning a double sided document.